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Effect of Planting Period on Rooting of Bog Bilberry Plant Green Cuttings

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Abstract: The article recommends planting the cuttings in the second and third ten days of August to propagate the bog bilberry plant from green cuttings. In cuttings planted during this period, the highest regeneration indicators were noted as follows: root formation - 18-19 days, branching - 22-23 days, and scientific data on a rooting rate of 85-87% are presented.

Keywords: Golubika, variety, seedling, green pencil, IMK (indolyl butyric acid), solution, water, substrate, soil, callus, root.

Introduction

In the world, scientific research related to the breeding and cultivation of bog bilberry is carried out mainly in the direction of its introduction to new areas, cultivation of valuable wild species, creation of high-yielding new varieties, development of modern seedlings, and crop cultivation technologies. In this regard, 5 types of it have been cultivated: thin leaf and Canadian bog bilberry (small bog bilberry), shield and southern bog bilberry (high bog bilberry), and Eshi bog bilberry ("rabbit eye"). Today, the introduced range of the common dove covers all countries of the northern hemisphere, namely China and many countries in Central America, Asia, and Africa.

Bog bilberry (Vaccinium uliginosum L.) is one of the fruit plants in great demand in the world consumer market. Cultivated varieties of bog bilberry are widely distributed in North America as a valuable food and medicinal plant. Bog bilberry fruits contain up to 8% sugars, up to 2.7% organic acids, up to 0.6% pectin substances, up to 1% protein, up to 1.6% fiber, up to 63mg% C, up to 0.02mg% V1, up to 550mg,% PP vitamins and up to 0.25 mg % of carotene [2; 28-29 pp.], [3; pp. 16-17].

The sugar and acids contained in bog bilberry fruit together with pectin and flavoring substances create the unique taste of bog bilberry fruit. In addition, they stimulate the appetite, increase the production of gastric and pancreatic juices, and stimulate (enhance) intestinal peristalsis [5; 23-29 p.], [2; pp. 29-30].

Bog bilberry is a plant that needs alkaline soil for moderate growth and development. Due to the special structure of the root system, trees require an alkaline soil with a pH of 4-4.5 [8; pp. 277-281].

Propagation of fruit and berry-bearing plants from green and semi-wood cuttings has been successfully used in fruit growing in recent years. The cultivation of seedlings of several fruit plants, which are not prone to vegetative reproduction, by treatment with growth-controlling substances has been proven in the experiments of many scientists in recent years [6; E3SWeb of Conferences 284, 03022 (2021)], [7; 1214-1220 p.].

Research method. Research on the subject was carried out at the experimental site of the Information and Consulting Center (Extension Center) at the Tashkent State Agrarian University. For the experiment, the Duke variety of bog bilberry was used, and cuttings were prepared from the mother bushes of the bog bilberry plant and planted in different substrates at different times. The experiment was carried out in four repetitions according to the following scheme:

a) the influence of the type of substrate on the rooting of green cuttings of the bog bilberry plant:

1. large river sand + bio humus (control);
2. large river sand + peat;
3. large river sand + pine wood shavings

b) the effect of planting time on rooting of green cuttings of bog bilberry plant:

1. Planting cuttings in the first ten days of July;
2. Planting cuttings in the second ten days of July;
3. Planting cuttings in the third ten days of July;
4. Planting cuttings in the first ten days of August;
5. Planting cuttings in the second ten days of August;
6. Planting cuttings in the third ten days of August;
7. Planting cuttings in the first ten days of September;
8. Planting cuttings in the second ten days of September;
9. Planting cuttings in the third ten days of September.

The experiments were based on Kh.Ch. Buriev and others' "Methodology of calculations and phenological observations during experiments with fruit and berry-bearing plants", was conducted according to the method described in the literature "Growing planting material by green cuttings" by F.Ya. Polikarpova and V.V. Pilyugina. Statistical analysis of the research results was done in Excel 2010 and Statistica 7.0 for Windows computer programs, with a confidence interval of 0.95%. It is calculated according to the Dospekhov style. At the end of vegetation, seedlings were sorted according to the requirements of current state standards.

Research results. In this experiment, a water concentration of 40 mg/liter of IMK, characterized by its high rooting capacity in our previous experiments, and large river sand + peat were used as an artificial substrate. The experiment was carried out in the same way as in the previous experiment on green cuttings of the Duke variety. In this experiment, according to the research program, green cuttings of bog bilberry were prepared at different times and after being treated with a solution of indoleic acid with a concentration of 40 mg/l of water, they were planted on artificial substrates consisting of large river sand + peat.

Our experiments to determine the effect of the planting period on the speed of regeneration processes in the green cuttings of the bog bilberry plant showed that the earliest formation of the initial root protrusions compared to the control was recorded in the experimental variant where the green cuttings were planted in the second and third ten days of August. In this experimental variant, the formation of the first root bumps was observed 15-17 days after planting. Early or later preparation and planting of green cuttings did not increase efficiency. That is, when the green cuttings of the Duke variety of bog bilberry were planted in the period from July to August, the formation of the first root bulges accelerated linearly, but at a lower rate than the above-mentioned

option. Therefore, when the cuttings were planted in the first ten days of July, the first root shoots appeared after 21 days, and by the first ten days of August, it was 18 days (see Table 1).

Table 1

Effect of planting date on regeneration of green cuttings of bog bilberry plant, 2020-2022 years

Time to plant green cuttings	The course of regeneration processes, day:			Total rooting cuttings, %
	initial root bumps	begin to form a gross root	cuttings begin to sprout	
1-10 VII	21	26	30	62
11-20 VII	20	24	29	73
21-30 VII	19	22	27	74
1-10 VIII	18	21	25	79
11-20 VIII	15	18	22	85
21-31 VIII	17	19	23	87
1-10 IX	18	20	24	84
11-20 IX	19	21	26	81
21-30 IX	20	24	28	77

Gross root initiation of bog bilberry green cuttings also differed between variants as a function of planting time, as did root protrusions. In this case, green cuttings, which began to produce roots the fastest, were recorded in the experimental variant planted in the second and third ten days of August. In this variant of the experiment, 18-19 days after planting cuttings, gross root formation began.

Earlier or later starting of the planting period did not give effect, that is, when cuttings were planted early, they started to form gross roots after 21-26 days, but when cuttings were planted later, they started to make gross roots after 20-24 days. The data in the above table shows that the time of planting also had a significant effect on the rate of shoot formation in green cuttings. In this case, the first signs of growth in green cuttings, i.e., the emergence of shoots, were the fastest in the option where the cuttings were planted in the second and third ten days of August. In this variant of the experiment, it was observed that the first shoots began to form 22-23 days after planting. It was noted that when the green cuttings were sown early, the onset of stem formation began after 25-30 days, and when sown late, this phenological phase began after 24-28 days after planting.

It was found that the time of sowing had a significant effect on the rooting index of the green cuttings of the bog bilberry. Experimental data showed that the number of cuttings formed from them, compared to the total number of planted cuttings, was the highest in the option where the cuttings were planted in the second and third ten days of August. In this experimental variant, the total number of rooted cuttings was 85-87%. When the green cuttings were planted earlier, the amount of total rooting was 62-79% according to the experimental options. In the experimental variants planted later, this indicator was found to be around 77-84%.

Conclusion. The results of the conducted scientific research show that it is recommended to plant the cuttings in the second and third ten days of August in order to reproduce the bog bilberry plant from green cuttings. In cuttings planted during this period, the highest regeneration rates are recorded: root formation - 18-19 days, the beginning of sprouting - 22-23 days, and rooting rate 85-87%.

The use of large river sand + peat as an artificial substrate gives good results when propagating bog bilberry varieties from green cuttings. In this experimental variant, compared to the control variant (large river sand + bio humus), the beginning of root formation is accelerated by 7 days, and the beginning of branch growth by 4 days. The total amount of rooted cuttings was 86%, and this

physiological indicator was 14% higher than the control option.

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